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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/844,530	04/27/2001	Leah M. Miller	01-008	3738

24319 7590 11/20/2002

LSI Logic Corporation
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M/S: D-106 Patent Department
Milpitas, CA 95035

EXAMINER

PATEL, ISHWARBHAI B

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/844,530

Applicant(s)

MILLER ET AL.

Examiner

Ishwar (I. B.) Patel

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 1-10, 21 and 32 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-20 and 22-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of specie I, claims 11-20 and 22-3,1in Paper No. 5 is acknowledged. The traversal is on the ground(s) that the search of specie II will not add significant burden is not persuasive because mutually exclusive embodiments comprising the species add additional search.

The requirement is still deemed proper and is therefore made FINAL.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Via holes as described in the specification is not identified in any of the figures.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the via holes as described in the specification are not identified in the figures. It is difficult to understand the invention, as

the arrangement of via holes is the crux of the invention, which are not identified in any of the figures.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 11-20 and 22-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The applicant is claiming connection of contact pads with via holes along with a specific routing of the traces, but as vias are not identified in any of the figures, it is difficult to understand the claims as to the number of column of vias and contacts.

Claim Rejections - 35 USC § 102

6. Claims 11, 17-18, 20, 22, 28-29 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by Shenoy et al., US Patent No. 6,198,635, hereafter, Shenoy.

Regarding claim 11, Shenoy discloses a printed circuit board comprising:

contacts in a contact array of rows and column on the printed circuit board, groups of n columns of the contacts electrically connected to n-1 columns of vias

disposed interstitially in a via array between n columns of the contact (contacts 104 and via 114, see figure 4, column 6, column 44-58),

a major vertical routing channel formed between adjacent groups of n columns of the contacts and the $n-1$ columns of vias, first electrical traces electrically connected to a first number of the vias, and the first electrical traces routed to an outside edge of the via array through the major vertical routing channel (channel region 118 and plurality of traces 120, see figure 6 and 7, column 7, line 34-50).

Regarding claim 17 and 28, Shenoy further discloses the contacts are signal contacts and in groups of two within the contact array (see figure 4).

Regarding claim 18 and 29, Shenoy further discloses signal contacts, power contacts and ground contacts, see figure 4).

Regarding claim 20 and 31, Shenoy further discloses the via array are disposed interstitially and diagonally between the contacts, see figure 4.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 12-16, 19, 23-27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shenoy et al., US Patent No. 6,198,635, hereafter, Shenoy.

Regarding claims 12-16 and 23-27, the applicant is claiming various arrangements of routing channels of the trace with plurality of such channels in vertical and horizontal direction. Shenoy discloses an exemplary embodiments with major and minor trace routing channels in one direction, however, the number of such channels will depend upon the size of the board and the number of contacts for signal, ground and power distribution, to have a better routing of trace with minimum number of layer. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Shenoy with multiple channels in horizontal and vertical direction in order to have better routing of the traces.

Regarding claim 19 and 30, though Shenoy does not explicitly discloses group of six contacts (Shenoy discloses group of four contacts), the grouping will depend upon the total number of contacts and the space available for better routing of the traces. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the circuit board of Shenoy with a group of six contacts in order to have better routing of the traces.

Conclusion

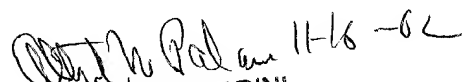
9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Horiuchi et al., Kwong et al., Horiuchi et al., Stewart, and Horiuchi et al., discloses circuit board similar to applicant's claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ishwar (I. B.) Patel whose telephone number is (703) 305 2617. The examiner can normally be reached on M-F (6:30 - 4) First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (703) 305 9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305 3431 for regular communications and (703) 305 7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 0956.

ibp
November 15, 2002


ALBERT W. PALADINI
PRIMARY EXAMINER